

respectively. Fluid line 56 connects chamber 46 back to fluid reservoir 10 so as to create a closed system. It is to be understood that although only one treatment chamber 46 is shown in FIG. 4, fluid lines 56, 58, and 60 may be branched so as to connect more than one treatment chamber in parallel to the system.

- 5       The fluid contained in reservoir 10 is retrieved through fluid line 60 by bladder pump 50. Fluid line 60, as well as all other fluid lines in the system, may be made of any type of medical grade, durable tubing suitable for transporting the fluid in use. Bladder pump 50 is comprised of a pneumatic pressure chamber 51 and a bladder 53, which may be comprised of a suitable elastomeric material. An illustrative suitable bladder is the Cutter/Miles double valved hand activated blood pump. Bladder pump 50 forces fluid from reservoir 10 to treatment chamber 46 through fluid line 58 by being alternately compressed and expanded by alternating pressure source 54 in conjunction with valve 52 and timer 55. Alternating pressure source 54 preferably may be any standard pump capable of providing positive and negative (or vacuum) pressure, such as a piston or diaphragm pump. Valve 52 accepts the positive pressure and negative pressure from pump 54 through lines 64 and 66, respectively. Due to signals from timer 55, valve 52 causes alternating positive and negative pressure to be applied to bladder 53 from line 62. Valve 52 may be any type of in-line valve capable of directing and regulating multiple lines. One such valve is the MAC 45S, model 45A-AA1-DAAA-1BA.

- 20       When negative pressure is applied to bladder 53, fluid will be drawn from fluid reservoir 10 through fluid line 60 until bladder 53 is filled with fluid and is in an expanded state. During expansion of bladder 53, check valve 74 will ensure that no fluid is drawn from fluid line 58. Once the signal from timer 55 causes a positive pressure to be applied to bladder 53, the fluid contained in the bladder is forced out of the bladder and through fluid line 58 to treatment chamber 46. When fluid is forced out of bladder 53, check valve 72 will ensure that no fluid is forced back into fluid line 60. This causes, a pulsatile, cyclic fluid flow to treatment chamber 46 through tube 48 and out of port 70.

- 30       If tube 48 is comprised of a rigid porous material, then the varying fluid pressure caused by the action of bladder pump 50 will force fluid to flow through the porous material. The fluid flow through the porous material will place a varying radial stress on vascular graft scaffolding 26. Alternatively, if tube 48 is